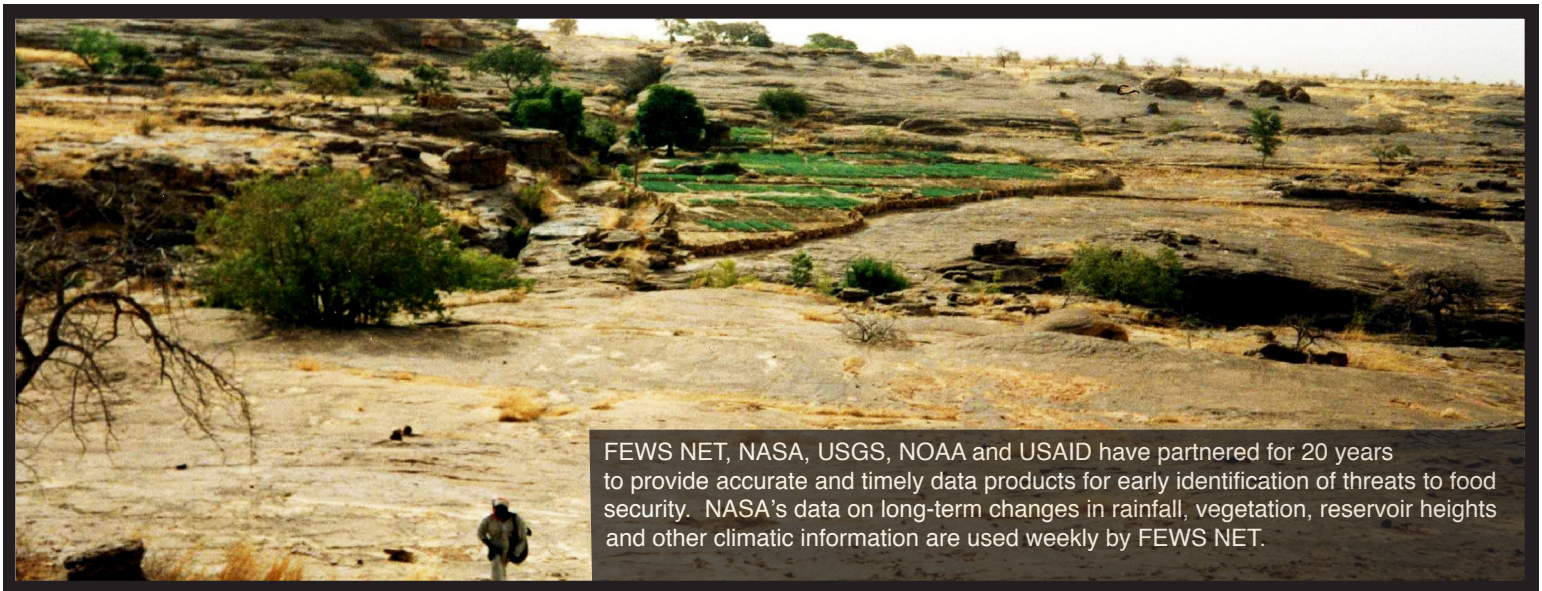
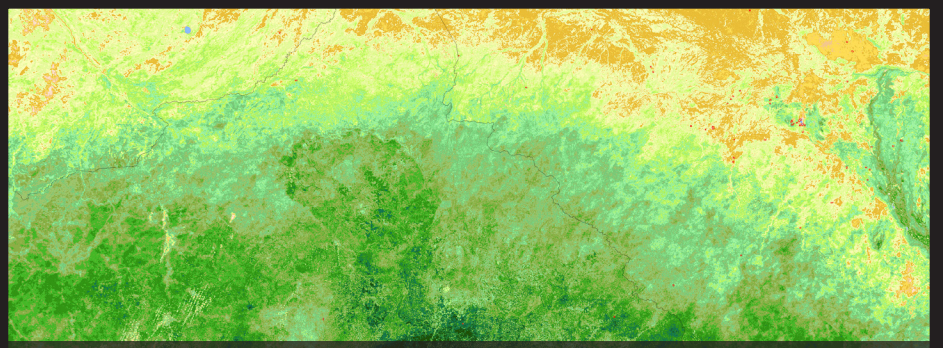
National Aeronautics and Space Administration

NASA and the Famine and Malaria Early Warning Systems



FEWS NET, NASA, USGS, NOAA and USAID have partnered for 20 years to provide accurate and timely data products for early identification of threats to food security. NASA's data on long-term changes in rainfall, vegetation, reservoir heights and other climatic information are used weekly by FEWS NET.

Malaria is trasmitted by female mosquitos



NASA MODIS Vegetative index of of Central Africa

Goals

Provide comprehensive satellite-derived remote sensing information about current weather and climate in near real- time

Statistical projections of vegetation, rainfall and humidity one to three months into the future

Integrated information about economic and climate variations which impact the ability of populations to access food.

Outcomes

Enhanced Earlier early warning of reductions in food availability

Focused and more accurate estimation of regions of sustained and severe food production deficits

Reduced expense and loss of life through earlier and more accurate decision making

Enhancing USAID Famine and Malaria Early Warning Systems with NASA Earth Science Results

Summary

The U.S. Agency for International Development (USAID) provides humanitarian assistance to vulnerable populations facing slow-onset disasters, due to drought or conflict, and rapid onset emergencies stemming from floods, landslides, earthquakes, tsunamis, and other catastrophes. To enhance USAID humanitarian programs, NASA Earth observation and modeling results will be integrated into famine and malaria early warning systems (FEWS and MEWS). The FEWS and MEWS programs use similar datasets at similar levels of accuracy and latency.

Presently, NASA MODIS normalized difference vegetation index (NDVI), NOAA's Advanced Very High Resolution Radiometer NDVI, TRMM precipitation, MODIS and AIRS humidity, and NCAR reanalysis products are being used to calculate standardized NDVI, precipitation, relative humidity, and total precipitable water indices. These data will be used to make statistical estimates of vegetation and rainfall 1- to 4-months in advance. Statistical climate projections can significantly strengthen famine and malaria decision support. Standardization and broadening of currently used NDVI and precipitation data to include humidity and precipitable water will significantly improve the ability to detect and quantify reductions in food production due to drought and flooding. High resolution, operational, near real-time and future projections of rainfall and vegetation information, will be integrated, via an updated and state of the art visualization system, into the current climate system.

The project will provide real-time and projected rainfall, temperature, vegetation and humidity data for both FEWS and MEWS. This work involves obtaining historical data for rainfall, precipitable water and vegetation using NASA datasets.

Project Details

The project will provide real-time and projected rainfall, temperature, vegetation and humidity data for both FEWS and MEWS. This work involves obtaining historical data for rainfall, precipitable water and vegetation using NASA datasets. The standardization of precipitation, humidity and NDVI and the creation of uncertainty measurements for these products will expand the ability of FEWS and MEWS to identify and properly diagnose negative and positive anomalies in growing conditions in Africa.

Once the data are in place, projections of rainfall, humidity and vegetation index will be conducted using locally tuned methods. The Matched Filter Regression technique will be used to project rainfall and relative humidity fields 1-, 2- and 3-months into the future. Then, projected rainfall and humidity fields will be used to produce projected vegetation index data for pastoral regions and semi-arid agricultural lands.

Data cubes, including past, present and future rainfall, temperature, precipitable water and vegetation data will be presented in a new viewer for improved understanding and diagnosis of growing conditions. Using web-based data analysis and mapping tools this project will develop a new web site servicing both FEWS and MEWS. By coordinating development with user requirements the ability of data users to identify and track negative and positive anomalies in growing conditions will be significantly enhanced.

The end result of the integration of NASA data into the USAID FEWS and MEWS programs will significantly strenghten the worlds decision support systems on famine and malaria.

For more information about this project

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NASA APPLIED SCIENCES PROGRAM & PUBLIC HEALTH

This application area focuses on the use of NASA assets to support planning and decision making for the public health, medical, and environmental health sectors. The application includes epidemiologic surveillance of infectious disease, environmental health, and emergency response and preparedness.
Public Health also explores issues of toxic and pathogenic exposure, natural and man-made hazards for risk characterization and mitigation, and improvements to health and safety.

Key Web sites

USAID FEWSnet
http://www.fews.net

Applied Sciences Public Health
http://nasascience.nasa.gov/earth-science/applied-sciences/national-applications/public-health

NOAA Climate Prediction Center
http://www.cpc.noaa.gov/products/fews/